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THE GEOGRAPHICAL DISTRIBUTION OF LAND BIRDS IN CALIFORNIA.

[With Plate IX.]

II. THE BOREAL PROVINCE.

BY CHARLES A. KEELER.

In considering in detail the avifaunal regions of California, the areas of the Boreal Province will first claim our attention. The Boreal Province of pre-glacial times was doubtless confined to a region far north of California, whence it was pushed southward by the ice, encroaching, probably, on the more tropical forms of life which then inhabited the country. When the cold abated the more plastic northern forms became acclimated to a warmer region, and now form a part of the Sonoran Province, while the more stable genera or species followed the receding ice northward or to a higher altitude in the same latitude. Accordingly we find in California that the Boreal forms have become stranded on our two mountain ranges. Although the Boreal Province may be naturally divided into two areas, one occupying each of the mountain chains, it bears the unmistakable stamp of unity, which indicates that the two areas have been differentiated in recent geological time; apparently in the post-glacial period. We find many characteristic Boreal species common to both areas, as, for example, the California pygmy owl, Harris's woodpecker, olive-sided flycatcher, Cassin's vireo and western creeper. Then there are a number of forms found in both areas in which there is merely a varietal difference. Among these may be mentioned the two varieties of the mountain partridge—one occurring in the Coast Range and the other in the Sierra Nevada Mountains. There are, nevertheless, quite a number of species which are very characteristic of the Pacific Coast Area which do not

breed elsewhere, while a still greater number occur only in the Sierra Nevada Area.

The Pacific Coast Area extends a little to the south of Monterey Bay, and thence north to Alaska. It first attains its most distinctive features in the extreme north of California, where a number of extremely deeply colored races begin to make their appearance. As we go northward through Oregon, Washington, and British Columbia, these deeply colored races increase in number and intensity. Among the varieties characteristic of this region may be mentioned the northwestern flicker, Stellar's jay and the chestnut-backed chickadee. It seems to me, however, that the territory inhabited by such dark races as the above should not necessarily be considered as a distinct faunal area; for these forms are of such recent origin that they are not sufficiently well marked in character or in the limits of their distribution to mark the bounderies of an area. All of these northern varieties shade insensibly into the forms occurring to the south of them. Thus, I have never seen a typical specimen of Stellar's jay from northern California, although it is the race ascribed to that region. These dark races seem to be directly dependent upon the abundance of rain fall which increases as we go north from California. Accordingly, in defining the southern limit of this area we should look to some more stable species, for a faunal area ought to have at least a few distinct *species* which are characteristic of it. There is, perhaps, no species which will better serve to mark the limits of the Pacific Coast Area in California than Vaux's swift. This species is a migrant in the southern part of the State, but breeds from the Santa Cruz Mountain region on the south, north along the coast into British Columbia. I have observed it at several localities during the breeding season, and it has always been in or near the redwoods. There are a number of species and varieties characteristic of the Pacific Coast Area (some of which also occur in the Sierra Nevada Area), which are always sure to be met with on entering a redwood forest which are seldom seen away from this tree. Besides the blue-fronted jay and Vaux's swift, which have already been alluded to, might be mentioned Cassin's vireo, Macgillivray's warbler, western creeper, and California chickadee.

The following table gives a list of the characteristic species of both areas of the Boreal Province:

Pacific Coast Area.	Common to both Areas.	Sierra Nevada Area.
Oreortyx pictus		Oreortyx pictus plumiferus
Callipepla californica		
Bonasa umbellus sabini		Dendragapus obscurus fuliginosus
		Accipiter velox.
	Glaucidium gnoma californicum	
	Dryobates villosus harrisii	
Colaptes cafer saturatior		Xenopicus albolarvatus
Colaptes cafer		Sphyrapicus ruber
Chætura vauxii		Chordeiles virginianus henryi
		Trochilus calliope
	Contopus borealis	
		Empidonax obscurus
Cyanocitta stelleri		
Cyanocitta stelleri frontalis		Cyanocitta stelleri frontalis
		Picicorvus columbianus
		Cyanocephalus cyanocephalus
Agelaius gubernator		Agelaius phœniceus
		Carpodacus cassini
Zonotrichia leucophrys gambeli		Zonotrichia leucophrys
Melospiza fasciata samuelis		Melospiza fasciata heermanni
		Passerella iliaca megarhyncha
Pipilo maculatus oregonus		Pipilo maculatus megalonyx
		Pipilo chlorurus
		Piranga ludoviciana
	Vireo solitarius cassinii	
		Helminthophila ruficapilla gutturalis
	Helminthophila celata lutescens	
Dendroica nigrescens		
Dendroica townsendi		Dendroica auduboni
	Dendroica occidentalis	
	Geothlypis macgillivrayi	
	Cinclus mexicanus	
	Certhia familiaris occidentalis	
	Sitta carolinensis aculeata	
		Sitta canadensis
		Sitta pygmæa
Parus rufescens neglectus		Parus gambeli
		Regulus satrapa olivaceus
		Myadestes townsendii
	Merula migratoria propinqua	
Turdus ustulatus		Sialia arctica

The Sierra Nevada Area, it will be seen, has a much larger number of characteristic species than the Pacific Coast Area, and is more sharply marked as a zoological region. It is in this area that the woodpeckers and warblers (*Picidæ* and *Mniotiltidæ*) attain their maximum abundance in the State; and they here form the two most distinctive families. The following woodpeckers breed in this area, although they are not all characteristic of it: Harris's white-headed, arctic three-toed, red-breasted sapsucker, pileated woodpecker, Lewis's, and red-shafted flicker. Of the warblers might be men-

tioned Calaveras, lutescent, yellow, Audubon's, black-throated gray(?)*, hermit, Macgillivray's, western yellow-throat and pileolated. The breeding range of the white-headed woodpecker may be taken as defining the limits of the Sierra Nevada Area in California. The southernmost record of its breeding is from the San Bernardino Mountains. Thence it occurs north along the coniferous district of the Sierra Nevada Mountains into Oregon. It is apparently more narrowly limited to this area than any other species, although some other species are nearly equally restricted to the region, as, for example, red-breasted woodpecker, calliope hummer, thick-billed sparrow, Louisiana tanager and mountain chickadee.

Like the Pacific Coast Area, this region exhibits its most characteristic features toward the north and becomes much less marked toward its southern terminus. There is this striking difference, however, in the changes which the two areas undergo as we proceed northward, that in the coast district we find a gradual change in color in the same species, produced by the direct action of the environment, while in the Sierra Nevada Area we find a gradual introduction of different species characteristic of a more northern climate. Examples of the former have already been cited; of the latter, such species as Richardson's merlin, pigeon hawk, and even Kennicott's screech owl,† doubtless breed in the extreme north of the State. A number of other northern forms extend their breeding range still farther south, some reaching the latitude of Lake Tahoe, although none of them are found in the southern part of the Sierra Nevada Area. Such species are pileated woodpecker, Williamson's sapsucker, Arctic three-toed woodpecker, Oregon jay, evening grosbeak, Kodiak pine grosbeak, American crossbill, Lincoln's finch, and ruby-crowned kinglet.

From the foregoing it will be seen that the Sierra Nevada Area, although possessing much in common with the coast fauna, is by far the more distinctive of the two as a subdivision of the Boreal Province, both in its greater and more continuous southward extension, and in the possession of species which are more markedly Boreal in form than any occurring in the Pacific Coast Area.

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* My only authority for supposing this species to breed in this area is a record from Big Trees, Calaveras County, where it was reported by Mr. Belding as rare in July: Proc. U. S. Nat. Mus., 1879, p. 393. It certainly is not a characteristic breeder of this area.

† Townsend: Proc. U. S Nat. Mus., 1887, p. 203.

NOTES ON THE NATURALIZED PLANTS OF SOUTHERN CALIFORNIA. VI.

BY S. B. PARISH.

THE CALIFORNIAN MESEMBRIANTHEMUMS. The genus Mesembrianthemum consists of some 300 species, mostly of Southern Africa, but a few outlying members, for the most part littoral, inhabit Australia, the Canary Islands, Arabia, and the borders of the Mediterranean.* In the New World the genus is wholly unknown, except along two stretches of the Pacific Coast, the one in North, and the other in the corresponding latitudes of South America. In the latter a single species occupies the Peruvo-Chilian region, and in the former four species have been found in California.

The Chilian species was at first taken to be endemic, and the name *M. Chilense* Mol., was given to it,† but it was subsequently reduced by Haworth‡ to a variety of his *M. æquilaterale*, a species founded upon Australian and Tasmanian plants.

The four species which have been collected in California have been considered to be introduced plants. That such is the character of *M. coccineum* there can be no doubt. This is known only from the collection of Mrs. J. G. Lemmon, made fifteen years ago at Moore's Landing and Carpenteria, near Santa Barbara. According to Mrs. Lemmon's remembrance, the plant was not abundant, and had probably escaped from cultivation. It has not since been met with, and is not known to resident botanists of Santa Barbara. Dr. L. G. Yates during the present season has kindly examined the original locality without rediscovering the plant. It may therefore be dismissed as probably a transient fugitive which failed to become established.

The three remaining species, however, occupy a very different position, and whatever may have been their origin, are both numerically abundant, and as regards at least two of them, widely distributed.

The earliest noticed of these is found as far north as San Francisco. It was at first referred by Dr. Torrey, with some doubt,

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*Benth. & Hook. Genera Plant, 1, 854.

†Gay Fl. Chili, iii, 7. Philippi. Cat. Pl. Vasc. Chili, 91.

‡DC. Prod., iii, 429.

to *M. mutabile* Haw.,* and subsequently, but still questioningly, to *M. dimidiatum* Haw.,† but is now united with *M. æquilaterale*.‡ It is not uncommon along the coast southward as far at least as San Diego, and has been reported from the islands of Santa Cruz§ and San Miguel‖ and from San Benito.** As seen on this coast, *M. æquilaterale* has long, lax stems, which are prostrate on the sands, or pendant from the cliffs of the seashore. Its fleshy triquetrous leaves are from two to three inches long, and the showy red flower, an inch in diameter, is succeeded by an edible fruit which is sometimes called "beach strawberry."

The next species, *M. crystallinum* Linn., has its northern limit at Santa Barbara. It is the most abundant and widely spread of the three, its range being much greater than is indicated in systematic works. It has been collected on most of the coast islands,†† on some of which it forms the principal vegetation, and attains its greatest luxuriance, single plants frequently covering a circle six feet in diameter.‡‡ It is likewise common and abundant all along the coast down to the Mexican boundary, and on both sides of the Peninsula from San Quentin to Calamujuet and El Rosario.§§ In the neighborhood of San Diego it covers thousands of acres of saline soil, extending as far as ten miles back from the seashore. Here in wet seasons it emulates the luxuriance of the insular plants, some specimens attaining a diameter of three feet and producing leaves eight

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* "The species of this genus are so difficult to determine in the dried state that we are by no means certain this one is rightly named." Torrey, Bot. Wilkes Ex., 303.

†Pac. R. R. Rep., iv, 75; vi, 67.

‡Bot. Calif., i, 251.

§Greene, Bull. Calif. Acad., ii, 399.

‖Greene, Pitt., i, 88.

**Brandegee, Pl. Baj. Calif., 165. The southern limit of all the species is ill defined. That of two of them has been greatly extended by Mr. Brandegee in the above cited paper, and his more recent expeditions may be expected to throw still further light upon this and other interesting botanical problems.

††San Miguel, Greene, Pitt., i, 82; Santa Cruz, Greene, Bull. Calif. Acad., ii, 399; Guadalupe, Greene, l. c. i, 223; Santa Catalina and San Clemente, Lyon, Bot. Gaz., xi, 333.

‡‡Greene, Pitt., l. c.

§§Brandegee, l. c.

inches long.* It has also been collected by Mrs. Brandegee on the Mojave Desert.

This plant is an annual, with diffuse stems and thick spatulate leaves, both of which, as well as the calyces, glister with crystalline papillæ. The flowers are showy and of a red color. The European habitat of the species is Greece and the Canary Islands.†

The remaining species, *M. nodiflorum* Linn., is the least known and apparently most restricted of the three. It has been collected on the two adjacent islands of Santa Catalina‡ and San Clemente,§ and on the continent at San Diego, on sandy ridges along the shores of both bay and ocean.‖ Mr. Cleveland collected it as long ago as 1876, and reports that it was as abundant then as now. It seems, however, not to have been known by the authors of the Botany of the Geological Survey, and is not mentioned in that or any other American flora with which I am acquainted. In the old world it is known from Egypt, Morocco, Corsica and Naples.** It is an annual, like the last species, and has a similar crystalline herbage, but is very much smaller, the stems seldom exceeding an inch or two in length. The leaves are narrowly spatulate, and the flowers small and greenish-white.

So far as writers have referred to the origin of these American ice-plants, they have dismissed them as "probably introduced," until recently Prof. Greene††has asserted the claims of *M. crystallinum* to be considered an indigenous plant. These claims if admitted are equally conclusive as to the two remaining species.

In considering this question the geographical distribution of the species is very significant. At San Francisco, its northern limit, the genus is represented by a sinple species, littoral there, but becoming also insular at the Channel Islands, and extending at least as far south as San Diego. At Santa Barbara the second species is

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*D. Cleveland, who states that while this plant is abundantly nectariferous, the honey made from it has a disagreeable taste, so that it is regarded as a pest by apiarists.

†DC. Prod., iii, 448.

‡Brandegee, Zoe i, 113. §Lyon, l. c.

‖D. Cleveland in lit.

**DC. l. c., 447.

††Pitt., i, 82.

added and continues, both on the mainland and on the islands, even below the southern boundary of the State. It is reinforced on the islands off San Pedro by the third species, which reaches the shores of the continent at San Diego. Thus at the latter place all the species are found, and they successively drop off as a more northerly latitude is attained. This is a natural arranegment for the species of an indigenous genus, and quite in harmony with the distribution of the southern flora. As the result of mere chance introduction it is not so easily understood.

Their topographical position is equally indicative of an indigenous origin. They are not the occupants of the waste ground of seaports, but mostly of a rugged coast, and of the lonely islets which lie in sight of it. They are as abundant in the wildest as in the more settled parts of the coast, and since the earliest mention of them notices their abundance, it is probable that they were then as fully established as now. They are especially plentiful on the islands, on each of which, if exotic, a separate introduction would be necessary.

The manner whereby their wide dissemination could have occurred is likewise hard to account for. Fruit and seed are unprovided with means for attaching themselves to the coats of animals, so that the convenient sheep cannot be made to bear the burden of their transportation. They are equally destitute of other means of locomotion.

The wide diffusion of the plants makes it necessary to place their introduction at the very earliest period of the Spanish settlement, and even then but scant time is afforded for their spread over sea and land to the great territory they now occupy. And how could the original introduction have occurred? Hardly as escapes from cultivation, which could only have been as ornamental plants, a character to which none have very strong claims and one none at all. Nor does the state of society at that time favor such a theory. Their reputed native sources, when the course of early Spanish commerce is considered, is averse to the supposition that they might have begun as ballast plants. What traffic there was then was not with Europe, but with the ports of Mexico and the other Spanish possessions, and it is through these countries that the Mediterranean contingent has reinforced our native flora. But there is no record of the presence of the ice-plants at these intermediary

ports. The introduction of the Australian species is even more unaccountable; nor can Chili be considered as the stepping stone by which it might have reached us, for the Chilian plant, even if not specifically distinct, is at least so different a form as to preclude it from being considered the parent of the Californian.

Nor are the Mesembrianthemums an anomaly in our flora. They belong, it is true, to an order which is very feebly represented in America. But it includes *Sesuvium portulacastrum*, a near ally of the ice-plants, which it closely resembles in appearance and habits. Like them it also is found in widely separated regions of the globe; but its place among our native plants has never been questioned.

On the contrary side there is the bare fact that there are Mesembrianthemums in other parts of the world which are believed to be identical with those growing here. This identification has not been made in all cases without doubt, while the plants are confessedly difficult to determine from dried specimens, which very inadequately represent the living plant.

No historical evidence is known, so that there only remains a consideration of probabilities, and the difficulties seem less in regarding them as indigenous than in adopting the opposite opinion.

CÆNURUS OF THE HARE.

BY KATHARINE BRANDEGEE.

[Read before the California Academy of Sciences February 6, 1882.]

Any one who has noticed the hare or "Jack rabbit" (*Lepus Californicus*) which is brought in such quantities to our markets from November to March, must have occasionally observed upon their loins and thighs swellings of considerable magnitude. Many are killed in which these tumors have developed to the size of an orange, though probably none so greatly disfigured are ever found in the markets. The health of the animal seems not to be at all affected by the parasite, and even in cases where its growth has been greatest very little inflammation is caused in the tissues, which are gradually pushed aside.

These swellings, which are well known to hunters and marketmen as "water blisters" or "water boils," are found in a very considerable proportion of the hares, but, so far as I have observed, do

not occur in the smaller species, the Brush Rabbit (*Lepus trowbridgei*), and Cotton-tail (*Lepus sylvaticus audubon*), of which I have examined hundreds of specimens. Although they are so frequently seen, I have never met with any one who had the slightest suspicion of their true nature—for these innocent-looking "blisters" are tape-worms in the larva stage, waiting patiently for their final transformation.

Tape-worms are exceedingly common, most animals harboring one or more, either in the perfect or the larva state, but they are rare in reptiles. They are true parasites, living entirely at the expense of their host, and repaying him in too many instances with disease and death. Their life history is now tolerably well known; those which belong properly to the carnivora, pass their larva stage in the flesh of some herbiverous animal which is the natural prey of its future host.

Tape-worms, in their perfect form, are rather inconvenient than dangerous guests. They can be dislodged with comparative facility; but unhappily this is not true of the larvæ.

The subject of this paper is a *Cœnurus*, a name given to those *Tæniæ*, which in the larva state develop many heads from a single vesicle by a process of budding. It has never been described from the hare so far as I know, but Mr. C. B. Rose, of Norfolk, England, published as long ago as 1833, an account of a cœnurus found in the rabbit of the warrens (*Lepus cuniculus*), which may be the same. Further investigations, and especially comparison of the perfect tape-worms, are necessary to settle this question.

The more detailed description which follows has been carefully made, and as the material is abundant can be readily verified by anyone accustomed to the use of a microscope.

On removing the skin from a hare affected with cœnurus, one or more swellings looking like bladders buried in the flesh, may be seen, ordinarily upon the loins or thighs, though they may be found in any part of the body. If the capsule of connective and muscular tissue which encloses the cœnurus be now carefully opened, a quantity of clear fluid and a bladdery vesicle escape. This vesicle is also filled with fluid, and has attached to its outer surface many smaller vesicles, and a great number, often many hundred papillæ, which, when fresh, are seen to be actively contracting. These papillæ, milk-white in color and attached by slender pedicels to the

vesicle, are about two lines in length and one in breadth at the widest part, which contains the head turned inward like the partly inverted finger of a glove. The body displays a number of transverse lines, indications of the future joints of the worm.

If one of these papillæ be carefully detached and placed under a microscope, moderate pressure upon the covering-glass will cause the enclosed head to protrude and bring to view its four sucking disks and double crown of pointed hooks, 14 or 15 in each row. The hooks of the inner row are double the size of the outer; but being attached half their length nearer the center, the points of all fall in the same circle. Just beneath the dermis are seen an immense number of round or oval bodies of a concentric structure, which effervesce strongly on the addition of sulphuric acid. These are the so-called calcareous corpuscles, and are supposed to act as a kind of external skeleton.

The head and neck of this cœnurus are much smaller in proportion to the body than are those of the cœnurus of the sheep, as it is shown in the drawings to which I have had access.

The natural hosts of the cœnurus of the hare are probably the dog and the wolf. Our wild dog, the coyote, will serve to illustrate the journey of its life. A hare badly infested with cœnurus, becomes swollen and deformed, and as the loins and thighs are attacked by preference, his powers of locomotion are seriously impaired. In this condition he falls an easy prey to his hereditary foe.

The coyote swallows not only the hare, but its 10,000 contained larvæ, a circumstance which would undoubtedly give his victim a feeling of malicious joy, if he were in a condition to know anything at all about it. The larvæ are set free in the stomach of the coyote by the digestion of the vesicle, and a certain proportion succeed in attaching themselves, by their hooks and suckers, to the walls of the small intestine, fortunately only a very small proportion, for their way is beset with dangers, and their extraordinary fecundity is calculated in proportion to their chances of safety.

The tape-worm is a colony of hermaphrodites, each joint of which is a sexually complete animal, male and female containing thousands of eggs. It reaches maturity in about six weeks, after which period the lower joints, and numerous free eggs are discharged at each evacuation, and deposited upon the ground, weeds or grass.

The eggs are so small as to be quite invisible to the unaided eye, and being furnished with a very thick envelope, have considerable tenacity of life. The hare swallows these eggs, either by feeding upon the grass and weeds, or by drinking from pools of water into which they have been washed. In the stomach the thick envelope is digested, the contained embryo is set free and immediately starts for its predestined resting place. This microscopic embryo is furnished with six hooklets, by means of which it penetrates the walls of the intestine and imbeds itself in the muscular tissue. Here it ceases to move, its hooklets fall, and it slowly develops into the polycephalous vesicle first described.

This paper has not been written to discourage the use of the hare as an article of food; on the contrary, the aim has been to point out the remedy for an evil, which is undoubtedly increasing. So far as is known this tænia does not develop in man, and if it were capable of doing so, the thorough cooking to which it is subjected would be a strong safeguard, underdone hare not being so popular a dish as roast beef rare, or ham warmed through.

From what has been said of the life history of the cœnurus, it is evident that if every affected hare were well boiled, or burned, the disease would become much less frequent. At present it is disseminated in such a manner as would almost lead one to suppose that the breeding of this parasite is an object greatly to be desired. These affected hares are sold every day in the market, and in face of the general ignorance of the nature of the tumors, no blame can be attached to the vendors. The health of the animal seems unaffected by the parasite he harbors, and in many cases they are so deeply buried as only to be discovered by incision.

These hares are either thrown away by the purchaser or are used for food after the tumors have been removed. In either case, they are eaten by dogs, which become infested in the same manner as the coyote, and like him convey infection to the hare again.

In the country this method of disposing of their bodies is still more objectionable, for they are found and eaten by various wild animals, and although the dog and wolf are the probable hosts of this cœnurus, it may have others, possibly the lynx and the fox.

NOTES CONCERNING THE COLLECTION OF PLANTS MADE BY XANTUS AT CAPE ST. LUCAS AND VICINITY.

BY T. S. BRANDEGEE.

The list collected by L. J. Xantus de Vesey, which was published by Dr. Gray in the Proceedings of the American Academy, contains one hundred and twenty-one species. The Euphorbiaceæ were determined, and the new species described by Dr. George Engelman, and the many other new species by Dr. Gray.

Xantus is remembered to-day by many people of the region; some of his guides are still living, and it is not difficult to obtain information concerning his routes of travel. His plants were collected between August, 1859, and February, 1860; the most favorable time of the year botanically, as the August and September showers of the rainy season cover the ground with short-lived annuals, and cause the dry and leafless shrubs to burst into leaf and flower, the whole landscape losing its ashen-gray appearance and becoming bright green. He collected at Cape St. Lucas, San José del Cabo, Miraflores and vicinity, and also visited Todos Santos and the high mountains of the interior. The mountain collection is said by Dr. Gray to have "unfortunately been lost." The collection from the Cape, and other places, is certainly small, and does not contain one-quarter of the flora of the region, but Mr. Xantus collected in many branches of natural history, and some of them seem to have received more attention than botany.

San José del Cabo is now the port of entry for the region about the Cape, and the much smaller settlement, Cape San Lucas, is tributary to it, as are also the villages of Miraflores, Agua Caliente and Santiago. At the time of Xantus, Cape San Lucas was the steamer landing, and the whole neighboring region was called by that name, but San José del Cabo, twenty miles distant, must always have been much the larger place, for it is situated near the mouth of the San José River, a running stream of good clear water that irrigates the sugar and cotton fields and orange groves of a broad valley many miles long, containing a large population when compared with the small cluster of houses known as Cape San Lucas. Xantus remained some time at San José, and probably most of the collection which laid the foundation of the botany of this region

and first made its treasures known, was gathered here. During the rainy season the air is full of moisture, the full heat of the sun is felt, and a person coming from the north has the feeling of being in a greenhouse among dripping plants, and the exertion which is possible later when the atmosphere becomes dry can not at this time be borne. The moisture of the air also makes it difficult to dry the plants, and in spite of the utmost possible care they are more disposed to mold than to become good specimens.

The collector in the field is in continual danger of being enveloped in a thunder storm and drenched by a tropical rain. It is not surprising that the mountain collection of Mr. Xantus should have been lost, for every one rides horse or mule back over the trails, and goods of all description are carried upon pack animals, there being no roads nor wagons. The trails over the inhabited portion are pretty good, but those into the high mountains are decidedly bad; they are steep, rocky, often overgrown with vegetation that drenches the traveler with dew and rain drops. The summits are hidden during the rainy months by clouds, and about the peaks it almost always begins to rain and thunder at noon. Any one who collects plants in these high mountains during the rainy season must expect to be wet all day and kept awake all night by innumerable mosquitoes, but will be repaid by the sight of many strange and handsome plants, of which he may carry away specimens if his papers are not destroyed by the rain.

Many plants grow about San José that Xantus did not collect, although they are very abundant and often very conspicuous; some because they are difficult to dry were perhaps intentionally neglected; such are the Portulacas, which abound, and are represented by five species. No mention is made of the cacti; a class of plants very difficult to prepare specimens from, but at that time the abundant ones were undescribed species; the giant cerei have since been named *C. Pringlei* and *C. pecten-aboriginum*, and the most abundant of the smaller ones is now known as *C. gummosus*. Xantus must have seen the handsome flowers of the latter species and eaten its delicious scarlet fruit, for at that time of the year it bears both, and the fruit is sold in town by boys, who collect it and remove the thorns. Why plants as abundant, handsome, conspicuous as *Plumeria*, were not collected, is not easy to imagine. This *Plumeria* is a tree sometimes twenty-five feet high, bearing at the ends of the

branches large leaves and an abundance of magnificent flowers, and is common on the mesas and among the foothills from San José del Cabo nearly to La Paz.

Some field notes upon the little known plants of the list may be of interest.

Argemone Mexicana L. Common at the Cape, is replaced in the north by the white flowered *A. albiflora.*

Lyrocarpa Coulteri Hook. & Harv., must be the same as the recently described *L. Xanti*, for in the notes it is said to be an annual with rose-colored petals. The true *L. Coulteri* is perennial with ochroleucous flowers, and does not appear to grow about the Cape Region.

Polygala Xanti, Gray, is common, and when growing among bushes reaches a height of four feet. The plant from Magdalena Island distributed as *P. Xanti* is probably *P. pubernla.*

Sida Elliotti T. & G. var? Since raised by Dr. Gray to specific rank under the name *Sida Xanti*, is abundant, and one of the handsome plants of the region, becoming frutescent, and sometimes four feet high. It is one of the many plants of the Peninsula that are large in the south and gradually become smaller as their place of growth is more northern.

Hibiscus ribifolius, Gray. One of the new plants of the Xantus collection, growing straight and erect, eight to ten feet high, with its leaves and flowers near the top of the plant. The flowers are two inches in diameter and yellow. It is a common plant of the Cape Region.

Gossypium sp., is probably *G. Davidsonii*, a common species of the region.

Cæsalpinia Mexicana var. *Californica* Gray. This appears to be the southern form of *C. pannosa*, described from near Comondu. As one travels southward it gradually increases in height from a small bush four to five feet high to a shrub sometimes fifteen or twenty feet high.

Mimosa Xanti, Gray, is abundant in the Cape Region, extending to the summits of the interior Sierras. At the beginning of the rainy season it bears a profusion of pink flowers.

Carphephorus atriplicifolius, Gray, now *Bebbia atriplicifolia* seems to be one of the plants that are small in the north and gradually becomes luxuriant southward.

Aplopappus arenarius Benth., is a plant of the sea shore, and in the field seems very different from the one referred to this species by Vasey & Rose.

Viguiera tomentosa Gray, blooms two months earlier than *V. deltoidea*, and is much handsomer, partly on account of its soft silvery leaves. Both species grow to be tall, reaching a height of fifteen feet sometimes.

Dysodia speciosa Gray, is a very handsome species, and found at low elevations from La Paz to San José and to Todos Santos. Amongst bushes it becomes five feet high, but when growing alone it is low and sometimes almost prostrate.

Physalis glabra, Benth., when protected by bushes becomes much branched and four feet high, but it is usually small, especially when growing upon the sand. It is very distinct from *P. crassifolia* of Magdalena Bay, to which it was formerly compared by the writer.

Celosia floribunda Gray, is usually a bush eight to ten feet high, but in some places becomes a small tree, having a well defined trunk. It seems to reach its best development along the streams north of Todos Santos.

Euphorbia leucophylla Benth., is extremely abundant on the ocean beach.

EL ZORILLO.

BY WALTER E. BRYANT.

Within the comparatively narrow confines of the extreme southern portion of the peninsula of Lower California, commonly known as the "cape region," is found a small terrestrial mammal more feared by the inhabitants than drought, yellow fever, small-pox or cholera—an animal which very few have ever seen, but known and dreaded by all. It is known to the Mexicans, as "zorillo," and to naturalists as the little striped skunk, recently described as a new species (*Spilogale lucasana* Merriam.) North of the Tropic of Cancer the skunk is not feared, but within the region south of the tropic the greatly magnified danger of hydrophobia, resulting from the bite of this animal, keeps many from the comfort of sleeping outdoors at night, and even closes the doors of the ill-ventilated houses.

During a recent trip from San Jose del Cabo to La Paz, I learned

that the belief in the certain and horrible death which would inevitably follow the bite of a skunk, was general, and while in the mountains, where the animals were said to be most numerous, the four Mexicans who were with me always slept near the fire, and with heads entirely covered by their serapes. Indeed, there was not a night when gathered about the camp fire but what some one had an account to give of an adventure with a rabid skunk, wild-cat, or panther. Some of the accounts were so detailed, especially in one instance, that I am forced to believe that there have been cases of death from the bite of a rabid skunk, but that all skunks are thus afflicted, and go wandering about seeking victims, is too absurd to be credited. No cases were reported to me from north of the tropic, and it would seem from this that from some cause the skunk is more subject to rabies in the lower latitudes. One or two told me that at times the skunks fed upon a certain species of black beetle (*Tenebrionidæ?*), and forthwith went mad. The most trusted guard against the "zorillos" are the cur dogs, which abound at every rancho. When starting for the high sierra near Agua Caliente we had two large dogs (capable of eating a man's rations) with us, but the first night out they fought and one deserted. I believe if both had run away the Mexicans would have gone no farther. I am told that Mr. John Xantus, while in the "cape region," was accompanied by two or three curs to keep away the skunks. One man of more than usual intelligence told me that while deer hunting in the Sierra de la Laguna he had lost a dog from hydrophobia, and one night while sleeping (with his head covered, of course) he had been awakened by the weight of some animal walking slowly along his body, and had waited until it was close to his head, when he suddenly threw it and blanket beyond his feet. Springing up he seized a stick from the fire in time to meet a skunk as it returned to attack him.

The malady is one of a very few for which the people have no remedy in the herbs of the country. The only reported case of a cure was by a foreign doctor, who treated a man who had become so violent that the authorities had ordered him to be shot. The doctor's method of treatment was of a heroic nature. The patient was first plunged into a stream of fresh water until apparently drowned, then taken out and when partly resuscitated certain internal medicines, the names of which the doctor would not divulge,

were given. The drowning was said to be for the purpose of rendering the patient susceptible to the effects of the medicine, and also to having the medicine administered. The man is said to be living to-day, and bearing the marks of his own teeth where he had bitten himself in his frenzy. My informant said he had tried half drowning a rabid dog in the sea and then administering a remedy which proved successful.

While at Agua Caliente news was brought that a child a few miles away had been attacked in the evening and bitten on the face by a rabid wild cat, but no opportunity was had to investigate this case, or any from skunk bite.

The usual manner of attacking by the "zorillo" is to creep up to sleeping persons and bite them on any exposed flesh, usually the face.

The little striped skunk of Texas is also said to be subject to rabies, and some seemingly authentic cases of death from biting have been reported.

During two months sojourn at the "cape region" this year I did not see or smell any of these animals, and could not obtain specimens even by offering a reward, hence I conclude that they were not common at any place where I have been, and consider that a man could travel in the region for a long time and would be exposed to more dangers from other causes than from the rabies of "el zorillo."

A NEW COTTONWOOD FROM BAJA CALIFORNIA.

BY T. S. BRANDEGEE.

POPULUS MONTICOLA.—A tree sometimes 1 m. in diameter and 25 m. high with ascending branches; bark rough, ash colored; new growth densely tomentose: leaves round-ovate, with a short point, variably sinuate-crenate or dentate, silky-pubescent upon both sides especially upon the veins, 3–7 cm. long, often broader, on terete white-tomentose, petioles nearly of the same length; stipules linear: bud scales white-silky: fruiting aments, 2–3 cm. long: capsules ovate, densely white silky-tomentose, 2–3 valved; styles usually two, united at base, each with two narrow divisions: disk small, nearly flat: scales minutely sinuate-dentate, nearly glabrous.

The tree inhabits the high mountains of the interior of the Cape

Region of Baja California, growing along the streams and following them into the cañons well down toward the warm lowlands. Young trees, about thirty feet high, have a smooth light-colored bark similar to that of the aspen, but that of the large ones is very rough. At high elevations (5,000 feet), and growing in cool rocky gulches, it is not more than twenty feet high. At lower altitudes it becomes a large tree nearly one hundred feet high, and is a favorite support for the wild grapevines. The very young leaves are tawny-tomentose, and the pubescence is still to be seen upon the old leaves after they have fallen from the tree. The wood is of light reddish color and is used for making furniture.

This cottonwood is known by the name "guerigo" to the inhabitants, who distinguish it from the common one of the fields and gardens, called by them "alamo." The leaves and flowers appear in February, and in October all have fallen, a season of growth usual in Alta California, but very different from the ordinary habit of the plants of the Cape Region of Baja California, where most of the vegetation comes forward with the summer and fall rains at the time when the cottonwoods are losing their leaves and appear to be preparing for a winter, which however never comes. The contrast between a flora dying and a flora coming into life at the same time, in the same place, is strange and interesting. Associated with the cottonwood in locality and in its habit of coming forward with the new year, are Arbutus, Rubus, Ribes, Gilia, Lupinus, Heteromeles, Prunus, Vitis, etc., although plants belonging to northern genera do not always belong to the flowers that bloom in the spring.

NOMENCLATURE AND ITS AMENITIES.

BY H. W. HARKNESS.

A rather acrimonious discussion has been going on recently between James Britten, editor of the London Journal of Botany, and N. L. Britton, editor of the Bulletin of the Torrey Club, anent the respective claims of *Tissa* and *Buda* to recognition in place of *Lepigonum* or *Spergularia*.

It seems to me that, in this instance at least, the editor of the Torrey Bulletin has the best of the argument. Priority, in all the walks of life, is reckoned quite as often by place as by time, and the

first name reached in reading any paper has, in my opinion, unquestionable priority over any succeeding one. The fact of all the names on a page being printed at one impression has nothing to do with the matter, a variable number of pages preceding and following are in the same case. It may, indeed, easily happen that this kind of question may occur in the printing of separate papers, one ending and the other beginning on the same page. If this position is correct it is idle to quote Dumortier's recognition of *Buda* instead of *Tissa*. In this world no number of wrongs ever make a right, though might frequently does—for a time. The Decandollean law "*Art. 55*, Dans le cas de réunion de deux ou plusieurs groupes de même nature, le nom le plus ancien subsiste. Si les noms sont de même date, l'auteur choisit," was probably intended to apply to differences in time. for most botanists have, perhaps instinctively, recognized priority of place.

After all these matters are pretty certain to settle themselves satisfactorily in time. and they are really of small importance as compared with studies of the organisms themselves.

The attitude of the Torrey Bulletin towards questions of nomenclature is probably responsible for a good deal of the opposition of the English school, the inconsiderate zeal of proselytes having wrecked many a promising undertaking. No one likes to be driven, and this journal has certainly attempted to drive. Whether the nomenclature of a paper was in accordance with the editor's views or not, has for a long time appeared to be of much greater importance than the amount of research shown on the number of new facts added to our knowledge.

An amusing instance of this kind of criticism was given in a notice of a paper by Dr. H. H. Behr, Prof. of Botany in the Pharmaceutical College in this city, where a sneering remark was made about "*Micrampeles*, which the author calls *Megarrhiza*"—Micrampeles being one of the doubtful names of Rafinesque, never as yet recognized by any one outside of the Torrey Club.

AN ABNORMAL NEST OF VIGORS'S WREN.

BY HARRY R. TAYLOR.

While hunting near Pleasanton, in the "balso," a swampy tract of land covered with willows, I found on May 13, 1889, a nest

of Vigors's wren *(Thryothorus bewickii spilurus)*, which is of interest from the very odd situation in which it was placed and its structure. About ten feet high in a slender willow, next to the trunk, was a bunch resembling a nest, and when I shook the tree, to my surprise, out flew a wren. I found that the nest, as such it proved to be, contained seven white eggs, very lightly marked with countless specks of brown. The nest was nicely concealed in a bunch of green leaves, and completely arched over with small, dry sticks. Further examination showed that it was built upon an old bird's nest, three-fourths of the structure at least being the work of the wren. It is large and quite compact, composed of fine shreds of bark with a lining of hair, feathers, willow catkins and a few bits of snake skin.

The nest measures externally 4½ inches in height by 5½ inches diameter. Inside the depth is 1¾ by 2½ inches. Except for the lining it has very little resemblance to a wren's nest. The nest of this bird has been described as identical with the slight structure of the common house wren. My nest must be of its unusual size to correspond with its strange position.

Land Birds of the Pacific District. In the absence of Mr. Belding, the author of this work, it may not be out of place for me to notice the criticism by C. A. K. in the last issue of *Zoe*, inasmuch as the entire MS. passed through my hands while preparing it for the printer, although my responsibility rested with the nomenclature rather than with accuracy of the text. The occurrence of *Spinus psaltria arizonæ* and the omission of the record (Ridgway's Manual) was doubtless an oversight as also the case with *Polioptila plumbea*, (the record of this species at Yuma is without the limits of the district) and *Spizella pallida*. The list published by Mr. Emerson (ZOE, I, 2, 44) was known to Mr. Belding, but some time limit had to be placed upon the work, and it was decided not to incorporate it. This, however, in justice to C. A. K., was not known to him. One or two others species were without verification and hence excluded (See Appendix, 267, 268.)

It certainly would have been of advantage, especially to younger students, if the name by which the species were originally recorded had been given.

Molothrus ater obscurus (132) is hardly entitled to be numbered with the birds of the district, and while *Passer domesticus* (189) is in the numerical list, the introduced species of *Phasiani* are not. Owing to absence part of the proofs were not seen by me, and hence the following corrections in authorities for names should be added to the errata:

Page 18 for (Ord.) read (Ord).
" 47 " (Bonap.) " Bonap.
" 52 " (Kaup.) " (Kaup).
" 52 " (Hoy.) " (Hoy).
" 59 " (Tschudi.) " (Tschudi).

W. E. B.

THE VARIATIONS OF PLATYSTEMON AND ESCHSCHOLTZIA.

BY KATHARINE BRANDEGEE.

In a previous paper* the writer called attention to the extreme variability of these western members of the poppy family; the very trivial differences upon which it was proposed to divide Eschscholtzia into numerous species, and the fact that *Platystemon* was susceptible of an almost equal amount of splitting.

Since the date of that paper many forms of these plants have been collected, and a portion of them distributed by the California Academy of Sciences, in the hope of making our variable species better understood. Notes and localities are here given for the more striking forms, so that any one having interest in the matter can verify readily those already known, and not too hastily believe that a "new species" is discovered, because variations from a local type make their appearance.

Platystemon Californicus Benth., locally known as Cream-Cups, is rather widespread, extending from Oregon southward to Socorro,† twenty miles below San Quentin in Baja California. This is the southernmost recorded station, but it probably extends considerably further south along the coast, though certainly not so

* Proc. Cal. Acad., ser. 2, i, 237, 1888.

† Proc. Cal. Acad., ser. 2, ii, 126.

far as San Ignacio, the head of the lagoons. The coast form differs considerably from that of the interior, being more branching, and generally prostrate-spreading; the pubescence is harsher usually covering the carpels, and seeds are not rarely matured in the cavity formed by the united carpels. At San Diego there grows about the bay a slender and dwarfed form, with the heads nodding in fruit; the soon separating carpels almost stellate-spreading. A similar but very low form was brought by Mr. Brandegee from Santa Rosa Island. The peculiar form found at San Simeon has been described before.† It grows on the bluffs of the sea shore, and the prostrate branches are often two feet or more in length. At San Pedro, the port of Los Angeles, and on the islands, the plants are similar to the last, but smaller, and the carpels usually seed-bearing. About Monterey the coast form makes a nearer approach to that of the interior, being more condensed and upright in growth. The erect, very hirsute capsules often bear free seeds, the stigmatic portion is about as long as the rest of the carpel, and the petals usually persist till the ripening of the seeds. In the vicinity of Castroville, fifteen miles to the north, were found the largest examples of the species I have ever seen; a single plant would have filled dozens of herbarium sheets. Their unusual size was probably due to the stirring of the soil, as they grew about the railway embankments and cuttings. The petals of these plants were persistent, and of a bright rose-purple, a color still retained after eighteen months in the herbarium, the stigmas about equal in length to the rest of the carpel, and occasionally free seeds were matured in the capsular cavity.

Platystemon in the interior region is more erect, less branching, the pubescence of softer hairs, yellow at the base and sometimes for the whole length, often curled at the extremity, and very variable in quantity, even in neighboring plants. The alternate petals, either persistent or fugacious, are sometimes of a deeper color, as is usual in a related species, and they are frequently eight or twelve instead of the usual number, six. The carpels are erect, either glabrous or hirsute, and so far as I have observed never mature seeds in the capsule. Specimens from Cahto, Mendocino County, have persistent petals, pubescence soft and white, stigmas very short.

† Proc. Cal. Acad., ser. 2, i, 240.

Plants from Stites, in Colusa County, from the same field, have the petals, either persistent or soon falling. In some of these specimens occur the longest capsules I have ever seen, sometimes more than an inch in length, and more or less twisted.

A very peculiar form grows at Colusa Junction, in the immediate vicinity of the railway station. The plants are rather tall and branching, pubescence soft, and the mature heads of fruit only a fourth to a third of an inch high, glabrous, glaucous, and almost perfectly globular. The stigmas are very short, and the petals only moderately persistent.

In the Tehachapi pass, at an elevation of over four thousand feet, grows the most densely hairy of all our forms. It was collected at that place, and added to the herbarium of the California Academy of Sciences by the writer as long ago as May, 1884, and it has recently been again collected by Prof. Greene, who described it as a new species, *P. crinitus*.* His description so abounds with erroneous statements that some correction of them may be pardoned here. He says "the petals are deep greenish yellow marcescent—persistent: stamens innumerable: short torulose pods scarcely longer than the persistent linear stigmas." The author must have been singularly unfortunate in his specimens. The pubescence, though more abundant, and perhaps a little longer, is scarcely softer, and no whiter than many of the forms of the Sacramento Valley. The stigmas are, of course, always persistent in all the forms, and vary in length in all. In specimens of so-called *P. crinitus*, before the writer, some of the capsules are three-fourths of an inch long, with stigmas one-fourth their length; the flowers are of the ordinary color of the species everywhere, and although the petals are usually persistent, they are certainly not marcescent. The author is equally mistaken in supposing that the buds of *P. Californicus* are "unvaryingly obovate," and it would probably not have occurred to any other botanist to call the stamens "innumerable," excepting in the sense of their uncertainty.

The variations of Eschscholtzia, recently collected, show that the pubescence, or roughness of the foliage, which was the chief

* Pitt, ii, 13.

character insisted upon in separating *E. maritima** as a species, is very common in the Coast forms of *E. Californica*. About Monterey, and between that place and Castroville, the ordinary perennial large flowered form is often covered with rough pubescence, even on the capsules and on the calyptra. The leaves are sometimes coarsely cut and condensed, sometimes dissected into long filiform divisions. The plants are generally green, having less than usual of the glaucous bloom, so striking in *E. maritima*. About Felton and other places in the Santa Cruz mountains, the plants are lower, more spreading, the foliage whiter and more condensed, but still scabrous. About Point Sur and San Simeon forms occur near the sea which are nearly as white and condensed as *E. maritima*, but not scabrous.

E. Californica (*E. peninsularis* Greene) is either annual or perennial about San Diego. The writer verified the fact by examining the roots, on Coronado Beach as well as on the mainland.

On the plains of the interior valley the perennial coast plant becomes more upright, merging into forms which make a close approach in habit, though larger flowered, to *E. minutiflora*. Such forms are found about Judsonville in Contra Costa County; near Tracy, and all the way down the San Joaquin Valley to Tehachapi (at which place in moist situations grows one the stoutest perennial forms); in the foothills behind Pasadena; through the mountains back of San Diego; and some distance down in Baja California. They are usually annual, but sometimes perennial. The rim of the torus is variable, usually narrow, and often obsolete.

E. minutiflora is almost as closely connected with an annual form found at moderate elevations on the eastern slopes of the coast hills and mountains. Examples of this have been collected on the road to the Sur, south of Monterey; on the crest of Ben Lomond, looking down on the village of Boulder Creek; on Loma Prieta, on the new stage road from Hopland to Lakeport; at Kelseyville; and near Eppersons (on the opposite side of the valley) in Colusa County. This ordinarily annual, but sometimes perennial plant, runs through a series of variations while preserving the same general habit. It is upright, unless of too rank growth, branching freely, but not so divaricately as *E. minutiflora*, the leaves are usually rather small. In a specimen from Loma Prieta, collected by W. W. Price, the upper ones are simple, the flowers an inch or less across. Some

* Pitt, i, 60.

of the examples from Ben Lomond are densely scabrous, some nearly smooth, those from Epperson's in Colusa County quite so.

The form described under the name *E. rhombipetala* has been found in grain fields near Stites, in Colusa County, where, though still low it grew upright.

FOUND DEAD ON THE BEACH.

BY WALTER E. BRYANT.

How many persons of the multitude annually visiting the Pacific Ocean beach near the Cliff House, and other places on the coast, have ever seen a dead sea-bird? Yet, between the months from November to April countless hundreds are washed ashore dead by every storm. The body of a large mammal makes its presence known and avoided within a few days after landing, but the birds, unless sought for, are easily overlooked amongst the sand and drift débris defining high water mark.

The recent rain storm which raged for a day or two in the early part of this month (December) was one of unusual severity as regards the violence of the wind; others have been more noted for the continuance of heavy rain-fall, both having an effect upon the destruction of bird life. Of the two I am inclined to believe, from limited observation and data, that a heavy and continuous rainfall for several days, accompanied with a fresh breeze (blowing twenty-seven miles an hour), or stronger, is more fatal to marine bird life than a more moderate rain-fall, and wind varying from a fresh breeze to a strong gale (sixty miles an hour) or greater at intervals. The late storm was of the latter class, and said by sea-faring men to have been the hardest storm ever known. It was a terrible south-easter, varying to the south and southwest, the wind rose in the dark night to a whole gale (seventy miles an hour) and occasional gusts were said to have bordered on the verge of a hurricane (over eighty miles an hour). Such a condition of weather was more than the strongest flyers could battle against. Bewildered by darkness and driving rain, exhausted and unable to find food, they were beaten down into the heavy sea, and those nearest land carried by the waves inshore, where, half buried in sand and drift, I found them the day after the storm abated. Patrolling the beach

southward from the Cliff House the largest victims of the storm which I found were short-tailed albatrosses (measuring a yard in length), birds which are supposed to be able to outride the roughest weather, but may have been caught in a breaking wave and thus perished, for they were heavy birds and in good condition. The smaller species may have met their death in a similar way or have been injured by flying against lighthouses or the set lights of vessels. Others may have been slightly wounded from gun shots and unable to cope with unusual weather.

It is notable that no land birds have been found dead even after storms occurring during the migrations.

The following nineteen species have been found upon the ocean beach of San Francisco County, others are known to have been taken at different places along the entire coast. For some of these names I am indebted to Mr. Keeler, who has several times patrolled the beach after a winter storm. The species are mentioned in something like the order of their numerical presence upon the sands.

Pacific Fulmar,
Western Gull,
Cassin's Auklet,
California Gull,
Pigeon Guillemot,
California Murre,
Rhinoceros Auklet,
Black-footed Albatross,
Short-tailed Albatross,
Glaucous-winged Gull,
Black-throated Loon.
Brandt's Cormorant,
Short-billed Gull,
Bonaparte's Gull,
White-winged Scoter,
Ruddy Duck,
Western Grebe,
Dark-bodied Shearwater,
Pomarine Jaeger.

RECENT LITERATURE.

On the Fate of the Quadrate in Mammals,* by R. BROWN, M.B., C.M., B. Sc. The author disagrees with all previous anatomists, who find the homologue of the missing quadrate bone in mammals in one of the auditory ossicles, and gives his reasons for substituting the "Interarticular Cartilage" as the homologue. Although this theory seems far more plausible than any previously advanced, more evidence is necessary to confirm it. "Should the present theory be

* Annals and Magazine of Natural History; vi, No. 35, p. 409.

confirmed by further research," says the author in conclusion, "the Interarticular Cartilage might appropriately be called the 'Quadrate Cartilage.'"

*The Cell Theory, Past and Present.** Part II. In this valuable paper we find a resumé of the theories of the leading histologists concerning the nature of the cell and its mode of reproduction, together with the views of the author on this most important subject. The general conclusions reached are that "a cell wall is not constant but of secondary formation. A free formation of cells within an extracellular blastema by deposition around a nucleolus to form a nucleus, and then around the nucleus to form a cell, does not take place. Young cells arise from a parent cell by division of the nucleus, followed by cleavage of the cell protoplasm, so that each cell is directly descended from a pre-existing cell." The paper concludes with a discussion of the bearing of the latest developments of the cell theory on the subject of heredity.

Note on the Soaring of the Hawk, by T. W. KIRK, F.R.M.S., etc., of the Geological Survey Department of New Zealand.† The author of this paper notices a quite similar case (the interlocking of the primaries of a hawk shot while soaring) to the one brought before the New York Academy of Sciences by Professor W. P. Trowbridge more than a year ago. The subject was discussed at length, and the impossibility of it occurring through the volition of the bird ably demonstrated. Recent literature on the subject may be found in Trans. N. Y. Acad., vol. vii, pp. 19, 75, 80.

North American Fauna, No. 4. Descriptions of twenty-six new species of North American mammals, by DR. C. HART MERRIAM. U. S. Dept. Agr., Div. of O. & M., Oct. 8, 1890. Contains descriptions of six new species and one sub-species of the genus *Spilogale;* four species and one sub-species genus *Tamias;* three species *Evotomys; Mustela caurina; Molossus californicus; Cynomys leucurus;* one species, two subspecies genus *Spermophilus;* three species *Dipodomys; Geomys bursarius lutescens; Hesperomys macropus.* Accompanied with three plates.

W. E. B.

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* Inaugural Address delivered to the Scottish Microscopical Society, by Sir William Turner, F.R.S., S.L. and E., President of the Society. Nature, November 13, 1890, p. 31.

† Trans. Royal Society of South Australia. XIII, i, 110.

Catalogue of Canadian Plants. Part V. Acrogens. By JOHN MACOUN. This part contains the Ferns and Fern Allies, and Additions and Corrections to vol. i–iv., which are rather extensive, embracing a hundred pages and conforming to recent revisions. The first of these additions, oddly enough, is a synonym, the western form of *Anemone nemorosa* having been separated* in 1884 under the name of *A. Grayi*, Kellogg & Behr. The work in general has been carefully done, and reflects credit upon the Government of Canada and the botanists concerned in its production.

List of Canadian Hepaticæ, by WM. HY. PEARSON. pps. 1–28, with twelve plates. This is a continuation of the Catalogue of Canadian plants, issued also by the Geological Survey of Canada. Mr. Pearson notes in the preface the great similarity of the Flora to that of Northern Europe. In the list of 165 species only one new one is described, a circumstance which speaks volumes for the good jndgment of the author.

Notes on the Leaves of Liriodendron, by THEODOR HOLM (Proc. Nat. Mus. xiii, pp. 15–35, pl. iv–ix.) In this very interesting article the author describes and figures numerous variations in size and form of the leaves of the tulip-tree (*Liriodendron tulipifera*) and argues from analogy that the many fossil species described from leaves, of comparatively slight variation are many of them at least doubtful. A very timely warning is given of the danger of working in fossil species without preliminary study of the range of variation in the nearest living representatives.

Bulletin of the Santa Barbara Society of Natural History, vol. i, No. 2. Several papers are contained in this number, besides the addresses, reports, etc. "Charm Stones," by L. G. Yates, is of considerable interest. The botanical papers show evidence, in some cases, of having been written a considerable time before publication.

Bull. Torrey Club, xvii, No. 11. Contributions to Canadian Bryology, No. 3: John Macoun. An Enumeration of the Plants collected by Dr. H. H. Rusby in South America, 1885–1886—xiv: N. L. Britton. Indian Bread Root: W. M. Beauchamp. Geographical Distribution of Phlox bifida: Frank McDonald.

* Bull. Cal. Acad., i, 5.

West American Scientist, vol. vii, September. New Coccids from California, by D. W. Coquillett, *(Dactylopius ephedræ, Pseudococcus yuccæ, Blastothrix yuccæ).* Outline of the Geology of Vancouver Island by M. Lopatecki. Californian Turtles, by C. R. Orcutt.

A list of State and Local Floras of the United States and British America, by N. L. BRITTON. Ann. N. Y. Acad., v, 237–300, 1889.

This paper is a reprint with some additions of the various lists which have appeared from time to time since 1881 in the Bulletin of the Torrey Club. The author says in the prefacing note: "No attempt has been made to incorporate all the notes and short lists of local observations, but it has been found difficult to draw the line in many cases. As in the former contribution, lists of species without exact localities have been indicated by (A); those giving stations by (B); those giving stations with notes or occasional descriptions by (C); and descriptive floras by (D)."

This lucid explanation is calculated to make it perfectly plain why such a paper as No. 565—Flora of Southwestern Colorado—twenty-two pages, with many notes and the descriptions of nearly a dozen new species, should be marked (B), and such others as No. 631—Botany of San Miguel, or 651—A List of Plants Collected by Mr. J. Albert Rudkin on a trip to Mt. St. Elias in the summer of 1883—with few notes and no descriptions at all, should be marked (C).

The geography of the author is to say the least peculiar. The Yellowstone National Park, the Big Horn Mountains, etc., are evidently on their travels, and Wyoming would do well to apply for a writ of replevin. The islands off the coast of California are also most of them transferred from the counties in which we are accustomed to find them.

The confusion in the author's mind concerning the distribution of western plants is evidently so great that unless the locality is especially given in a title, one may expect to find it in the wrong list. Thus King's Report, which dealing with the plants of Utah and Nevada, one would expect to find in the "Great Basin Region," is under "Catalogues of Transcontinental Expeditions," and nearly all the Surveys for the Pacific Railroad, certainly equally "transcontinental," are in the California list.

The author may have overlooked or considered of trivial

importance the Californian collection of the Wilkes expedition; Gray's account of the Plants of Fremont's second expedition; the various papers of Drs. Gray and Watson, dealing with plants of the Pacific Coast, such as "Characters of New Plants of California and elsewhere principally of those collected by W. H. Brewer and H. N. Bolander in the State Geological Survey. Proc. Am. Acad, vii, 327–402," and "vol. vi, 519–556," as well as their numerous revisions of almost purely Pacific Coast genera; Alphonso Wood's Liliaceæ; Dr. Parry's revisions of our genera Chorizanthe, Ceanothus, Arctostaphylos and Alnus; Prof. Trelease's paper on Ceanothus; and many others, but his almost total neglect of the work of a man who was for a long series of years the best known botanist of the Pacific Coast is inexplicable. It can hardly be that a personal dislike has so warped his judgment that he can seriously consider the papers of Dr. Kellogg, often of considerable length, scattered through the Proceedings of the California Academy, and describing hundreds of species, of less importance, than for instance, Nos. 611, 612, 613. The only evidence even of his existence furnished by this list is No. 618—Forest Trees of California—a paper written in popular style for the Report of the State Mineralogist. Even the paper in Bull. Cal. Acad., i, 128–151, giving a list of the species described by him, with explanatory notes, is passed over.

It would be of interest also to know why the lists of Suksdorf's Washington Plants, of Pringle's Californian, of Marcus Jones' from California to Utah, Collier's list of the Trees of Oregon, etc., were omitted, as until the completion of Gray's Flora of North America they furnish almost all the available data concerning the distribution of plants in some regions. It may be that being lists of plants offered for sale they are considered of no importance, but if so why was Gerald McCarthy's similar list of a region in which the flora is very well known, included?

Not being so familiar with the literature of eastern botany, the writer cannot judge whether or not the lists for those regions are so hopelessly muddled and leave so very much to be desired as the western ones certainly do.

K. B.

PROCEEDINGS OF SOCIETIES.

CALIFORNIA ACADEMY OF SCIENCES. *November 17, 1890.* President Harkness in the chair. Meeting held in the Mechanics' Institute.

Dr. George M. Sternberg was elected to membership.

Mr. James T. Boyd read the following report:

The undersigned committee, appointed on Monday evening, October 20, 1890, to prepare resolutions expressive of the feeling of the members in respect of Captain R. S. Floyd, deceased, herewith submit the following.

JAMES T. BOYD,
RALPH C. HARRISON,
THOMAS P. MADDEN,
Committee.

Resolved: That his fellow members of the California Academy of Sciences have heard with profound sorrow of the death of Captain Richard S. Floyd, a member of this Society and President of the James Lick Trust, in which this Society is largely interested.

Resolved: That in his death this Society has lost a valued member and the community an honorable, intelligent and upright citizen.

Resolved: That this Society recognizes with pride the valuable services to science rendered by him in his devoted, intelligent, untiring and successful efforts to carry out the wishes of its benefactor, James Lick, in the construction of the great telescope and in the erection of the Observatory upon Mount Hamilton, so munificently provided for in his Deed of Trust.

Resolved: That while we thus recognize his services to our State and to mankind, we cannot but feel that in this his crowning life-work he became a martyr to his sense of duty, and that his early death was in great measure due to his devotion to the sciences he loved so well.

Resolved: That to the faithful and intelligent administration of the Trusts by the Board of Trustees, of which the deceased was President, imposed upon them by Mr. Lick, this Society is largely indebted for its present excellent financial position.

Resolved: That we offer to the bereaved family our most sincere condolence in their and our common affliction.

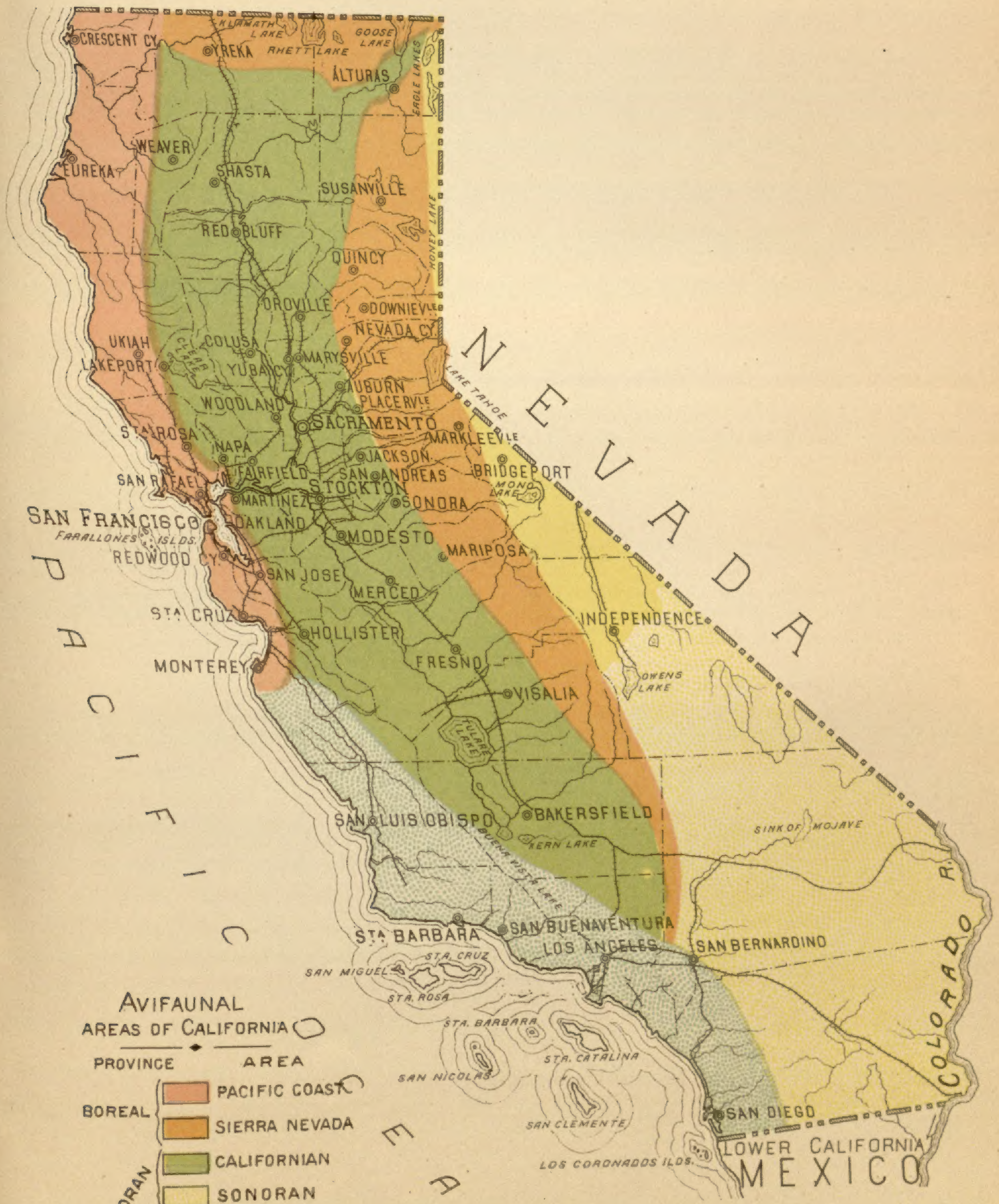
Resolved: That a copy of these resolutions, properly engrossed and mounted, be presented to the widow of the deceased.

Resolved: That these resolutions be spread upon the journal of this Society.

On motion the report of the committee was adopted.

Mr. Walter E. Bryant made some remarks upon his recent trip to the "Cape Region" of Lower California, where during the months of September and October he was engaged in the study and collection of zoological specimens for the California Academy of Sciences. The climate and topography of the country, together with its productions, were briefly noticed. Some also of the most interesting of the birds and mammals which were obtained were mentioned. He was followed by Mr. T. S. Brandegee who described the peculiar character of the flora of the region.

OREGON



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BOREAL	PACIFIC COAST
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